ARITERM

INSTALLATION AND OPERATING INSTRUCTIONS

- Ariterm 35+

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GENERAL

The Ariterm 35+ is an economic, durable and environmentally-friendly, bottom fire, wood-burning central heating boiler. Heating is periodic and based on storing energy in the warm water accumulator tank. Usually this boiler is used for heating detached houses, farm buildings, etc. Logs up to 50 cm long can be used as fuel. Light fuel oil can also be used if an oil burner is fitted. In order to take advantage of all the features, it is important to observe the instructions given in this booklet.

TRANSPORTATION, STORAGE AND OPENING THE PACKAGE

Receiving the goods

The boiler is delivered in a wooden frame. On the bottom is a pallet, which can be used to lift the boiler safely. It is advisable to open the package as close as possible to the installation location. The factory insures the boiler against transport damage, which includes transport from the factory to the first intermediate storage point. It is important that whoever receives the boiler should check its condition before accepting it. In cases of damage, the seller must be contacted immediately.

Storage

The boiler can be stored in the open air if protected from rain, but storage indoors is recommended.

Opening the package

After opening the package, open up all the hatches and check the equipment list to see that all loose equipment has been supplied.

Disposal of packaging: plastic cover to the refuse tip, wooden planks can be burned.

INSTALLATION

Installation of the boiler can only be done by a company or individual with the necessary professional accreditations. Installation should be performed so that it meets the generally accepted laws and regulations applicable to the industry. Electrical installation work must be done only by a qualified electrician.

Space requirements

An area of 1 metre must be reserved in front of the boiler for cleaning and maintenance procedures. Above the boiler, a space at least as high as the height of the boiler must be reserved for convection.

Flue connection and combustion air opening

Flue requirements for Ariterm 35+:

- Steel flue: height at least 4 m from the floor of the boiler room to the top of the flue, inner diameter at least 150 mm
- Brick flue: height at least 4 m, free cross-sectional area at least 290 cm^2
- For already existing flues, check the fire-technical suitability of the flue from your local fire safety authority.

The free surface area of the combustion air opening must be about the same size as the flue. This opening must never be covered.

Plumbing connections

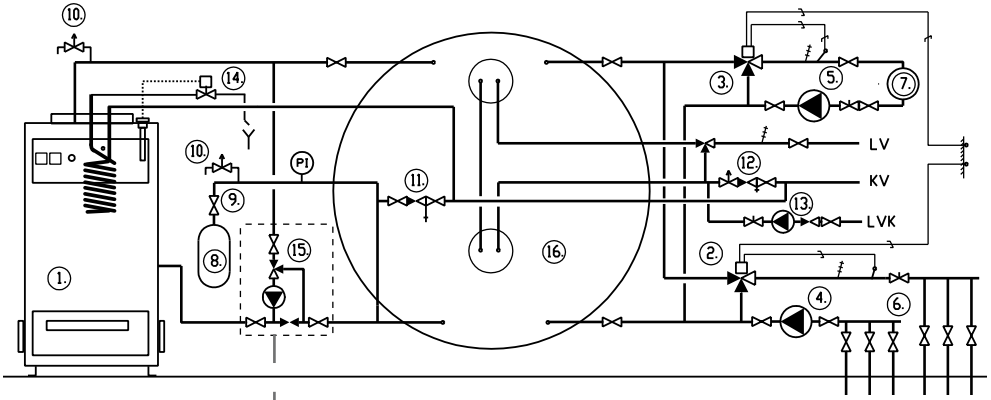
Ariterm 35+ is intended for use with an accumulator tank. Before installation of the boiler, the heating system must be flushed and a water pressure test carried out. The tightness of the connections must be ensured before installation. The factory is not responsible for damage caused by leaking connections.

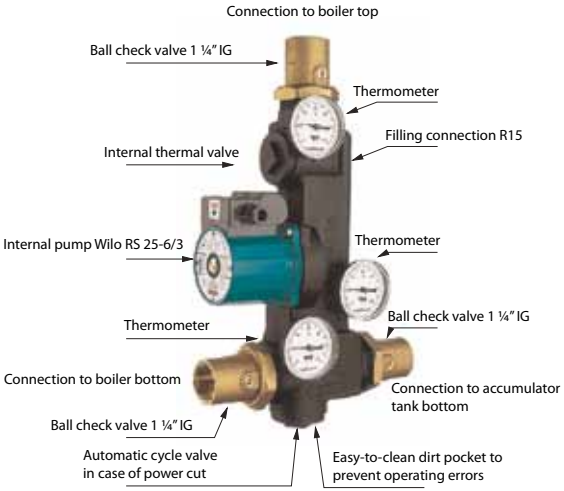
Safety vent installation

The vent must be CE-approved with a maximum opening pressure of 1.5 bar and a minimum size of DN 15. The safety vent must be selected according to the highest pressure class of the equipment assembly. No equipment may be installed between the vent and the boiler, as this may interfere with the connection. The exhaust pipe must be dimensioned and installed so that it neither restricts the exhaust efficiency of the vent, nor causes a hazardous situation when the vent is in operation. The volume of the expansion tank must correspond to the greatest change in fluid volume that occurs when the equipment is in use. In periodic heating, the expansion volume must be about 10% of the overall system volume. We recommend the use of only a closed system (film expansion vessel).

INSTALLATION

The water returning to the boiler must be about 70°C. This is achieved by using a bypass connection in accordance with the circuit diagram. In order to maintain a sufficiently high temperature during the heating period, the convection surfaces should be kept clean, to ensure highly efficient burning. The life expectancy of the boiler will also be increased, because corrosive acids will not be created on the heating surfaces.




Connection to boiler top
Ball check valve 1 ¼" IG
Thermometer
Filling connection R15
Internal thermal valve
Internal pump Wilo RS 25-6/3
Thermometer
Thermometer
Ball check valve 1 ¼" IG
Connection to boiler bottom
Connection to accumulator tank bottom
Ball check valve 1 ¼" IG
Automatic cycle valve in case of power cut
Easy-to-clean dirt pocket to prevent operating errors

Part	Name
1	Ariterm 35+ boiler
2	3-way valve, underfloor heating
3	3-way valve, radiator heating
4	Heat supply pump, underfloor heating
5	Heat supply pump, radiator heating
6	Underfloor heating system manifold
7	Radiator heating system
8	Expansion vessel
9	Service shut-off valve
10	Safety vent
11	Refill valve
12	Input mixing valve
13	Process water circulation pump
14	Thermal safety device
15	Accumulator switch Laddomat 21 (LVI-5012912)
16	Warm water accumulator

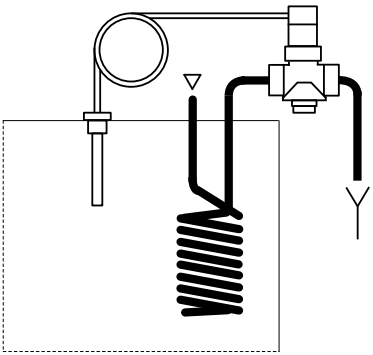
INSTALLING THE TEMPERATURE LIMIT VALVE

The Pressure Vessel Directive requires that a manually-filled wood-burning boiler must be equipped with a safety device, which prevents the boiler from overheating if circulation in the accumulation tanks is prevented for some reason. The Ariterm 35+ boiler includes a cooling spiral. We recommend the SYR 3065 temperature limit valve for this boiler. This does not, however, replace other safety devices such as a safety vent.

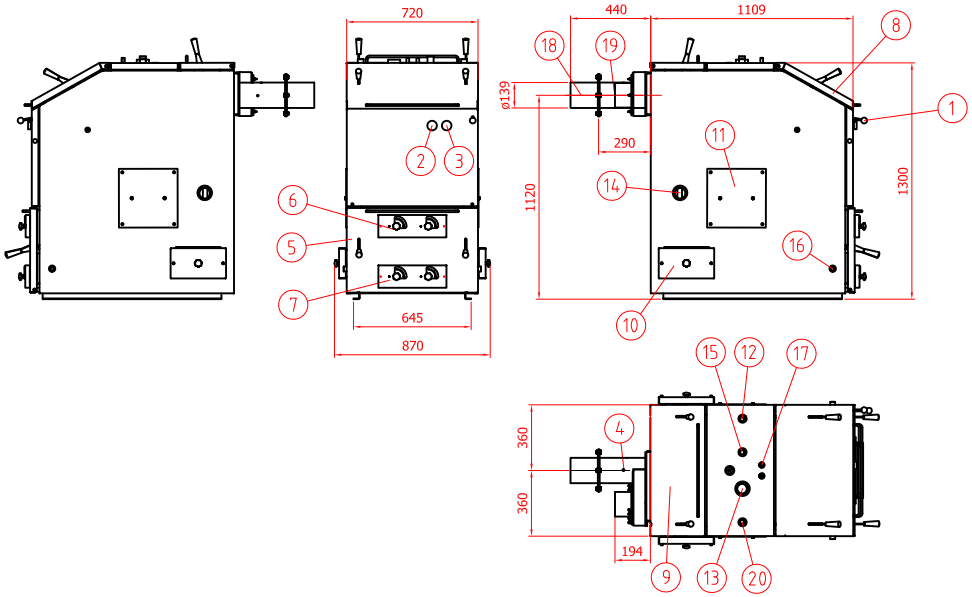
Installation

The temperature limit valve is connected to the cooling spiral or to the fork-junction in the warm process water pipe so that when the valve operates, it sends hot water down the drain. The temperature sensor is installed on the sleeve on the upper part of the boiler, using a DN 20 x 150 well.

TECHNICAL SPECIFICATIONS	
Max. input water pressure	10 bar
Opening temperature	97° C
Valve available from Ariterm Oy	Product no. 5012912



DIMENSIONS AND CONNECTIONS

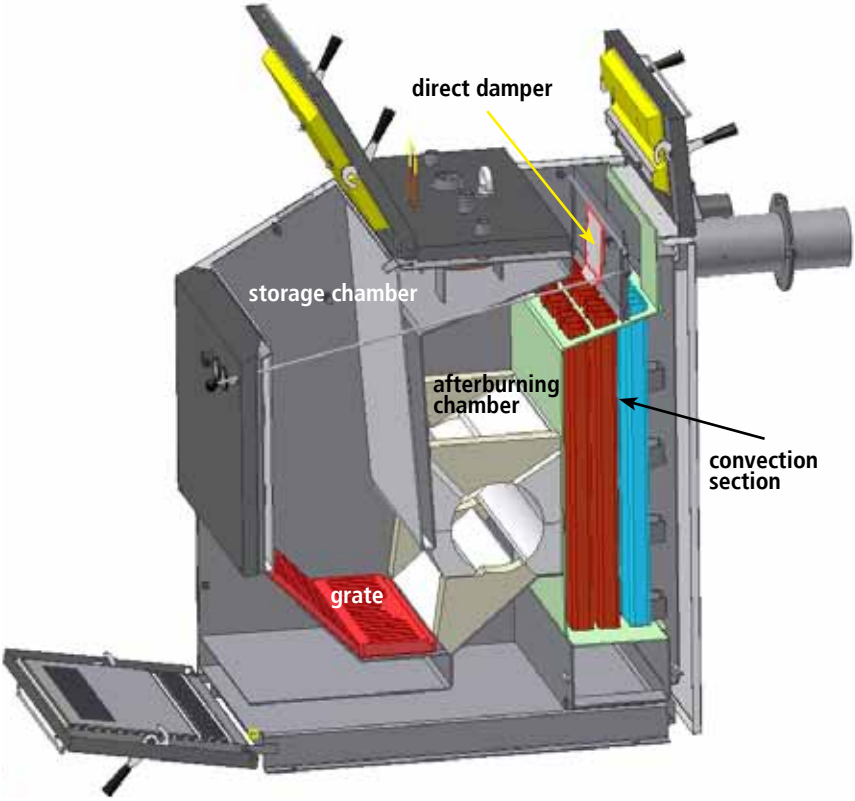


Part	Name	Unit
1	Turning plate adjustor	
2	Water pressure gauge	
3	Water thermometer	
4	Combustion gas thermometer	
5	Firebox hatch	
6	Primary air damper	
7	Secondary air damper	
8	Refill hatch	
9	Convection cleaning hatch	
10	Convection ash removal hatch	

Part	Name	Unit
11	Fixed hatch for afterburning chamber (hinged service hatch an option)	
12	Safety valve connection	DN 20
13	Water accumulator outlet	DN 50
14	Water accumulator return	DN 50
15	Expansion unit	DN 25 outer thread
16	Blow-off unit	DN 15
17	Cooling spiral units	Cu 15
18	Flue connection	168
19	Flue gas fan (A35-121D)	
20	Boiler water temperature sensor pocket	

TECHNICAL SPECIFICATIONS / BOILER CROSS-SECTION

TECHNICAL SPECIFICATIONS		
Performance values:	Power	20 - 40 kW
Measurement data:	Width Depth Height Weight empty Water capacity Storage chamber volume Burning time Size of refill opening Chimney recommendation	800 mm 1109 mm 1300 mm 690 kg 150 L 120 L 37 kg / 3 h 550x350 mm 150 mm, 4 m
Design and adjustment values:	Boiler operating pressure Permitted operating temperature Suitable size of accumulator Max. length of logs	0,5-1,5 bar Max 120 °C 1800 – 3000 L 0,5 m



OPERATING PRINCIPLE

The Ariterm 35+ boiler is meant for use at full power, then complete gasification of the wood will take place and the combustion will be clean. The amount of energy available from the boiler to the accumulator will be optimal and the need for cleaning small. The boiler will also last longer with proper burning.

Wood gasification

This takes place at the grate at the bottom of the storage chamber. The primary air needed for gasification rises through the plate-controlled damper to the carbonisation section, where the wood gasifies. The refill hatch is inclined at an angle, so loading the wood into the storage chamber is easy and safe. Gas-powered dampers make hatch opening easy. The storage chamber expands as it goes further down, so is wide enough to ensure that wood does not get stuck against the chamber walls. The chamber has a volume of 120 litres, which will accommodate about 37 kg of dry firewood. Burning time is three hours without having to add more wood, and the temperature in a 2000-litre accumulator will rise by about 50°C, if no heat is being used at the same time.

Afterburning of gases

This takes place in a round ceramic chamber, into which pre-heated secondary is introduced. Adjustment of the secondary air is done using the lower damper. The key factor in clean combustion is the complete mixing of combustion gases and pre-heated combustion air at a high temperature. In the afterburning chamber, the temperature rises to almost 1000°C, at which point different gases emitted from the wood ignite and are completely burned. The afterburner chamber is a vertical cylinder and is made of ceramic parts.

Heat recovery

This takes place in the carefully dimensioned convection section, in which heat is efficiently transferred from the super-heated combustion gases to the boiler water. The convection section is vertical, so that fly-ash does not accumulate on its inner surfaces. Regular brushing of the convection section keeps the boiler efficient.

INSTALLATION OF THE GRATE AND CERAMIC COMPONENTS

It is advisable to carry our installation with the assistance of somebody else. Clean the boiler well and carefully remove any pitch that may have accumulated, so that the parts will fit into place. The grate should be installed before the ceramic parts through the firebox hatch, so that the denser part of the grate goes backwards. Take care as the grate weighs about 50 kg.
The bricks should be installed through the opening at the side in the following order:

1. Lower brick
2. Lower parts of side brick
3. Lower part of front brick
4. Lower part of rear brick
5. Upper part of rear brick
6. Upper parts of front brick. The upper parts support each other with a suitably sized piece of wood in between, for example.
7. Upper parts of side brick (2 pcs) (pay attention to left-or right-handedness). Remove the temporary support then installation is complete.

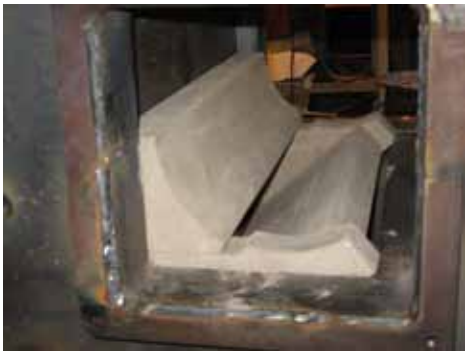
1. Lower brick

2. Lower part of side brick (2 pcs)

2. Lower part of side brick (2 pcs)

3. Lower part of front brick

INSTALLATION OF THE GRATE AND CERAMIC COMPONENTS



3. Lower part of front brick

4. Lower part of rear brick

5. Upper part of rear brick

5. Upper part of rear brick

6. Upper part of front brick. The upper parts support each other with a suitably sized piece of wood in between, for example.

6. Upper part of front brick

INSTALLATION OF THE GRATE AND CERAMIC COMPONENTS

6. Upper part of front brick.

7. Upper parts of side brick (2 pcs) (pay attention to left-or right-handedness). Remove the temporary support then installation is complete.

Installation of base bricks

1.

2.

3.

OPERATION

Introduction into use

Before running the boiler, check the following:

- the heating system and boiler are full of water, pressure at least 0.5 bar
- the heat supply pump is on
- the system valves are open
- the combustion air opening is open
- the safety vent is in unhindered contact with the boiler and is operational
- the relief valve is operational
- CHECK that afterburning chambers bricks are in right position.

First heating cycle

The boiler's afterburning chamber is ceramic, and may contain moisture when new. In order to ensure that the bricks dry out, it is advisable to keep the hatches open before heating if the boiler is inside. In the first heating cycle, keep a small fire going for about three hours, ensuring that the combustion gas temperature does not exceed 140°C. After that, you can heat normally.

Basic adjustments

Adjustment of the damper:

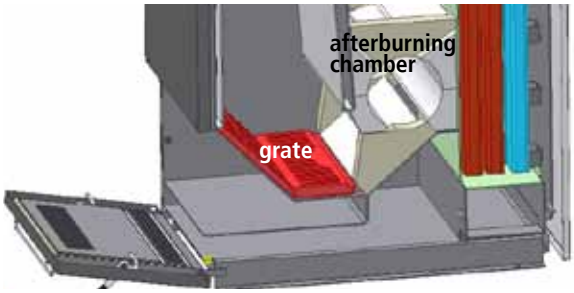
1. Set the primary air regulators to position 3.
2. Set the secondary air regulators to position 5.
3. The recommended combustion gas temperature is under 140°C. The combustion gas temperature in question shows that the combustion temperature in the ceramic chamber is sufficiently high for the ignition of all gases and for clean combustion. Under such circumstances, the boiler is at its most efficient and the need for cleaning minimal.
4. The recommended underpressure in the flue is 40 Pa, when the boiler is in operation. By removing one mounting bolt from the flue gas fan, can measuring be done through the bolt hole.
5. The draft can be adjusted from the control unit by changing the output power of the flue gas fan.

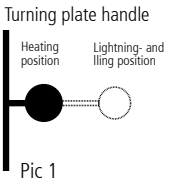
Lighting the boiler

Current regulations on limiting emissions resulting from wood burning have set major challenges on the development of combustion technology. As a result of the development, wood-burning boilers have become increasingly efficient and less and less firewood is required for heating. These changes make the boilers more difficult to operate by natural means. Unless the boiler is equipped with a flue gas fan, ignition by natural means is only possible with the help of adequate preheating.

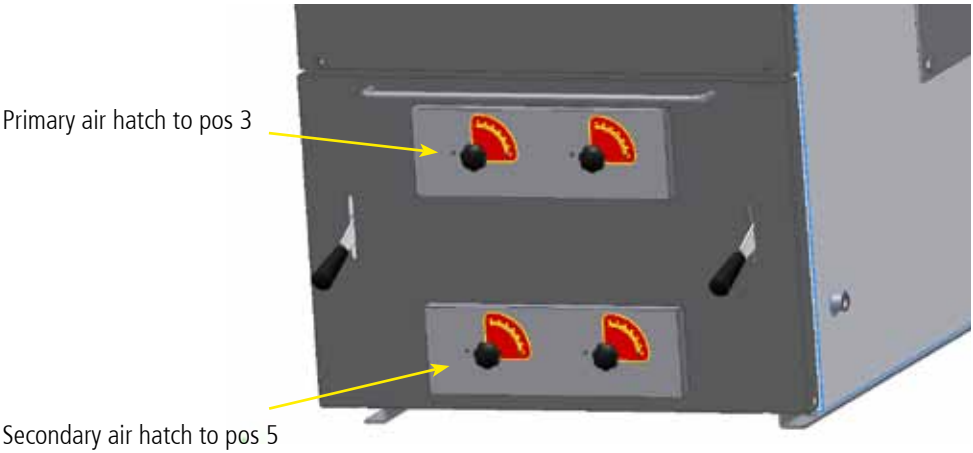
The following instructions should be followed carefully when igniting the boilers:

1. The service hatch must be fully closed throughout the heating cycle. Check that both the (upper) primary air regulators are set to position 3, and both the (lower) secondary air regulators are set to position 5.
2. Clean the grate and check that the surface of the ash that has accumulated underneath the grate is not touching the grate.
3. Open the smoke damper and pull the turning damper out into the ignition position.
4. Check that the charger cycle is fully functional and double-check that the charging pump thermostat is set to 65 degrees.
5. Start flue gas fan from control unit.
6. Insert the charge through the feed hatch onto the lower edge of the grate, all the way to the afterburner opening, and light the fire.
7. Lay approximately 5 kg (an armful) of dry firewood of small diameter onto the charge, near the afterburner opening. Close the feed hatch and leave the fire undisturbed for 15–25 minutes.
8. DO NOT ADD FIREWOOD UNTIL THE ENTIRE CHARGE LOAD HAS CHARRED. Carefully open the feed hatch slightly and wait until the smoke is flowing back into the boiler. Lay DRY firewood measuring no more than 50 cm in length into the reserve box in a COMPACT and even formation. Position the wood in the fire box with care.
9. Check that the wood catches fire. Burning wood makes a clear humming sound.
10. Once the wood has caught fire and the temperature has reached 150 degrees or higher, the turning damper can be pushed into the heating position.





Pic 1



Refilling

Refilling is recommended when the storage chamber is about 1/3 full of wood.

1. Put the turning plate in the ignition position.
2. Slowly open the refill hatch, which will release the burning gases from the storage chamber.
3. Fill the storage chamber.

N.B. Fuel should only be refilled when the energy created can be stored in the accumulator tank or otherwise consumed. Boiling of the accumulator tank and boiler must be avoided.

Cleaning

1. Before cleaning the boiler, it is advisable first to heat it, preferably with softwood, in order to make it easier to remove soot. Clean the boiler's convection section 2-4 times per month and whenever required.
2. Once the fire has gone out but the boiler is still hot, open the cleaning hatch on top and brush/scrape it clean.
3. Open the cleaning hatch at the side and remove any loose incrustation with an ash scraper.
4. Open the firebox hatch, clean the grate and empty the ashbox into a fire-proof ash bucket.

N.B. The surface of the ash must never rise up to touch the grate. This prevents cooling of the grate and will rapidly result in damage. For this reason too, the holes in the grate must be open.

Ensuring the tightness of the hatches

All pitch, etc. must be removed from the hatch seals and sealing surfaces. If leaks appear in the hatches, these must be eliminated. This can be done by turning the locking pin cam to a different position. If this does not help, the seals must be changed.

THE USE OF ALTERNATIVE FUELS

Use of an oil burner

An oil burner can be installed in the burner opening on the side of the boiler, either with or without the use of the quick-change hatch. When using the quick-change hatch, a hatch coupling must be fitted. The burner must always be removed from the combustion chamber when solid fuel is being burned. All hatches and air openings must be tightly closed when using an oil burner.

Use of electricity

No electrical resistors can be installed in this boiler. They should be fitted in the accumulator tank.

Pellet use

Ariterm 35+ is compatible with an KMP PX22 pellet burner. Replace the stoking hatch with a hatch with an PX22 pellet stoker. If you use a pellet burner, close primary and secondary air vents. Specified instructions on the installation and use of the pellet burner come with the burner.

WARRANTY AND REMOVAL FROM USE

Warranty

For Warranty Issues Ariterm Sweden AB refers to our local Distributor.

Removal from use

A boiler that has reached the end of its life can be used for scrap.

MOST COMMON SPARE PARTS			
Part number	**Name**	**Additional information**	**Quantity**
13863	Plane grate		1
13886	Askew grate		1
13611	Front brick lower	545x115x109	1
13612	Rear brick lower	545x126x88	1
13613	Lower brick	446x255x50	1
13614	Side bricks lower part	50x150x275	2
13615	Side bricks upper part left	50x131x322	1
13616	Side bricks upper part right	50x131x322	1
13617	Front brick upper	545x104x215	1
13618	Rear brick upper	545x210x137	1
13375	Gas spring		2
5880	Thermometer		1
5883	Combustion gas thermometer	0-500 °C	1
5882	Pressure gauge	1566 SWOY	1
10040	Brush	40x80x110 M12	1
3492	Brush arm	1250 mm	1
5805	Locking pin sleeve	inc. screws	1

DECLARATION OF COMFORMITY

ARITERM

VAATIMUSTENMUKAISUUSVAKUUTUS

Valmistaja: ARITERM OY
Osoite: PL 59, 43101 SAARIJÄRVI

Laite: **Ariterm 35+**

Valmistaja vakuuttaa,

- että tämän kattilan valmistuksessa on huomioitu Euroopan yhteisön neuvoston painelaitedirektiivin (97/23/EY) olennaiset turvallisuusvaatimukset ja noudatettu seuraavia direktiivejä: Konedirektiivi 2006/42/EY, Pienjännitedirektiivi 2006/95/EY, EMC direktiivi 2004/108/EY.
- Vaatimustenmukaisuuden arviointimenettelynä on käytetty H - moduulia. (Ilmoitettu laitos 0424)
- kattila täyttää standardin EN 303-5 vaatimukset (luokka 3)

DECLARATION OF CONFORMITY - MANUFACTURERS DECLARATION

Manufacturer: ARITERM OY
Address: P.O.BOX 59, FIN-43101 SAARIJÄRVI

Equipment: **Ariterm 35+**

Manufacturer assures,

- that in the production of the boiler the essential safety requirements of EC council's directive for pressure boilers (97/23/EY) have been complied with. Following directives have been applied: Machinery directive 2006/42/EC, Low voltage directive 2006/95/EC, EMC directive 2004/108/EC.
- As estimation method of conformity has been used H - module. (Notified body 0424)
- the boiler fulfill the requirements of standard 303-5 (class 3)

FÖRSÄKRAN OM ÖVERENSSTÄMMELSE - TILLVERKAREDEKLARATION

Tillverkare: ARITERM OY
Adress: P.O.BOX 59, FIN-43101 SAARIJÄRVI

Apparat: **Ariterm 35+**

Tillverkare försäkrar,

- att vid tillverkningen av denna panna har man iakttagit väsentliga säkerhetskrav av EG rådets direktiv för tryckkärl (97/23/EY). Tillverkare har även iakttagit följande direktiven: Maskindirektiv 2006/42/EG, Lägspänningsdirektiv 2006/95/EG, EMC direktiv 2004/108/EG.
- Som värderingsmetod av överensstämmelse har använts H - modul. (notified body 0424)
- pannan uppfyller krav för EN 303-5 (klass 3)

Ariterm Oy, 9.3.2011

Petteri Korpioja
Toimitusjohtaja
Managing director
Verkställande direktör

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ARITERM

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Inspectan arvioima Paineastia-valmistaja
inspecta sertifiointi

ISO 9001
ISO 14001
DNV
SERTIFIOITU ORGANISAATIO

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